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The full significance of the result of these inoculations was not realized at the time since it was not then known that *Sphæropsis* occurred on these blighted areas. In the spring of the present year, however, a *Sphæropsis* was found to be comparatively abundant on the diseased bark of pear trees in the station orchards. Since that time a large number of pear trees from various localities affected with body blight have been examined and in nearly every instance this fungus was found to be more or less abundant. One case particularly worthy of notice was that of a comparatively young orchard that was severely attacked by body blight and the fruit of a *Sphæropsis* was so abundant that the conclusion was irresistible that this fungus must be the cause of the disease.

Numerous inoculations made this spring with cultures of the *Sphæropsis* in large trees and in nursery stock clearly show that this fungus may produce body blight of pear trees.

Other species of fungi closely associated with the *Sphæropsis* frequently occur on trees attacked by body blight, *Macrophoma malorum* (Berk.) Berl. et Vogl. being specially abundant. The studies have not yet progressed far enough to determine what part these other fungi play in producing the diseased condition. Bacteria may also be concerned in this trouble, but of this we have as yet no proof.

W. PADDOCK.

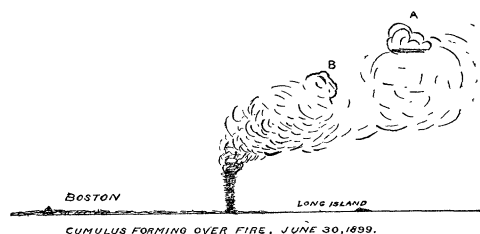
GENEVA, N. Y.

FORMATION OF CUMULUS CLOUDS OVER A FIRE.

IN SCIENCE of January 8, 1897, Mr. R. DeC. Ward describes the formation of cumulus clouds over a fire in Cambridge. Last Friday (June 30th) another phenomenon of this kind was observed at Blue Hill and from Winthrop and approximate measurements of the height obtained.

The fire was in South Boston and consumed the buildings of the Bay State Iron Works. The smoke cloud was not of unusual size, but rose vertically to a considerable height (800 to 1,000 metres), encountering at this height a north-westerly wind, which swept it nearly horizontally over the harbor. The fire began before 8 p. m., and the smoke reached its greatest height about 8:05 p. m. At 8:03 p. m. a

small white cloud began to form at the apex of the smoke, which at this time was apparently nearly over Long Island, in Boston Harbor. The cloud increased rapidly in height, assuming the form of a true cumulus and reaching its greatest size at 8:05 p. m. The accompanying sketch shows roughly the appearance of the smoke and the cumulus at that time. The sky



was nearly clear, no other low clouds being in the vicinity of the smoke. The cumulus cloud is shown at (A) and apparently was about 3° in height and length, the highest or thickest end being toward the north. Between 8:05 and 8:07 p. m. another smaller cloud formed at the edge of a rift in the smoke considerably lower than the one just described. Its position is shown at (B). Mr. A. E. Sweetland, of this observatory, who at this time was in Winthrop, about 5 miles (8 kilometres) northeast of the fire, estimated the altitude of the highest cumulus to be 15°, while a measurement made with the nephoscope at Blue Hill, about 10 miles (16 kilometres) south of the fire, gave 10° as its altitude as seen from the observatory. These measurements show that the vertical height of the top of the cloud at A was at least 2,500 metres, while that of the cloud at B was about 2,000 metres, above sea level.

The smoke began to diminish in quantity at 8:07 p. m. and separated from the clouds, which became flatter and more elongated. At 8:11 the clouds were separated from the smoke by a space several degrees wide, and after this time they slowly evaporated.

S. P. FERGUSON.

BLUE HILL OBSERVATORY, July 1, 1899.

A REPLY TO MR. MARLATT'S ARTICLE ON SOURCES OF ERROR IN RECENT WORK ON COCCIDÆ.*

WHEN I lived in Colorado, some years ago, I remember hearing it said that a man who had

* SCIENCE, June 16, 1899, pp. 835-837.

been there six months knew all about the weather, but one who had been there six years never knew anything about it. A similar paradox is common in biological science; and hence it results that Mr. Marlatt, who has only recently begun the study of Coccidæ in detail, is much more sure about the nature of their specific characters than the present writer, who has been occupied with these insects for eight years. If there is one thing which the detailed study of species teaches, it is that *no man can prophesy beforehand what characters are going to prove specific and what variable*. When the material available is scanty it is largely a matter of guess work to pick out the specific characters, and the majority of new species proposed must be regarded in a sense as provisional. Indeed, the conditions for the absolute proof of the validity of a species are rarely fulfilled, since it has to be demonstrated that nowhere in its whole range does the alleged species intergrade with any other. Let the ornithologist of the Middle States, familiar with the yellow-shafted *Colaptes*, go to the Far West and find there the red-shafted species, *C. cafer*. In either locality he may examine thousands of birds, yet the differences are quite constant; the species are indubitably 'good.' But now let him go to eastern Wyoming, and he finds the two inextricably mixed up, and concludes that there is only one *Colaptes* from the Atlantic to the Pacific.

' The general statements made by Mr. Marlatt are most of them applicable to the majority of Coccidæ, and so far are neither new to nor unheeded by the authors of the work he criticises. But there are exceptions, more numerous, probably, than most of us imagine. Take the often quoted case of the Jamaican *Aspidiotus aurantii*, which attacks palms and lignum vitæ, but never *Citrus*. This creature is indistinguishable, so far as known, from the pest of the orange tree found in California and elsewhere. Mr. Marlatt cannot fail to see that a distinction of this sort, however troublesome to the systematist, is both of scientific and economic importance. But this form of *A. aurantii* has not yet been proposed as a species, in the ordinary sense of the word, nor has it even any name. Some *varietal* names have been proposed by

Maskell and King for a few Diaspinæ which burrowed under the epidermis of plants, and this fact is thus distorted by Mr. Marlatt: "Several *species*, or *subspecies*, of scale insects have been established on accidental variations of this character, as, for example, *Chionaspis furfurus*, var. *fulvus*, King. Examples of the types of this *species*, * * * etc." It really looks as if the writer of the paragraph considered variety, subspecies and species to be synonymous terms!

What has really happened is this: In the course of years past, one after another, new forms of *Aspidiotus* came to the hands of students of Coccidæ. These were examined and, when apparently distinct from others, were described and named, sometimes as species, sometimes as varieties. Some little time ago Mr. Marlatt proposed to make a critical study of *Aspidiotus*, based on the valuable collections of the Department of Agriculture and such other material as could be obtained. Those who had described new species mostly sent their types or co-types, and thus Mr. Marlatt had before him a much better series than any other student, few of the valid species being lacking. The present writer has had the pleasure of going over Mr. Marlatt's work, and gladly testifies that it is excellent and will, when completed, mark a great advance in our knowledge of the genera examined. As might be expected under the circumstances, Mr. Marlatt has detected various errors in the work of his predecessors, and in other cases believes, but cannot prove, that their conclusions are wrong. Several species are to be reduced to varieties or synonyms; some varieties are to be raised to species. For all of this let us be sincerely thankful, but it is not an occasion for running *amuck*. The present writer never sat down to any lengthy piece of work without finding many things to be changed in his own former results and those of others. It is quite useless to hope to avoid error, but by continuous study we may gradually approach nearer and nearer to truth. That is all I ever hope to do or expect of others.

"The writer trusts that the foregoing criticisms will be taken in the kindest spirit, as they are intended, and he does not wish it

to be thought," etc., etc. (cf. Marlatt, l.c., p. 837).

T. D. A. COCKERELL.

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POT-HOLE VS. REMOLINO.

TO THE EDITOR OF SCIENCE: In your issue of July 14th you publish a communication from Mr. Oscar H. Hershey, in which he advocates the substitution of the Spanish word 'remolino' for the term 'pot-hole,' as applied to rounded cavities formed by rivers in their rock-beds.

The term pot-hole may not be elegant, but it certainly expresses the object to which it is applied more correctly than would the Spanish word he seeks to adopt in its place. The definition of 'remolino' is a whirlpool, or whirlwind; it is also applied to a turbulent or disorderly mob of people.

While a whirlpool may be the cause of a 'pot-hole,' it would be improper to substitute the cause for the effect.

The fact that the word *remolino* is not properly applied in the Republic of Colombia, perhaps only colloquially, is no justification for the introduction of an incorrect term into American scientific nomenclature.

F. F. HILDER.

WASHINGTON, D. C., July 15, 1899.

NOTES ON INORGANIC CHEMISTRY.

THE pupils and former colleagues of Professor Joly, of the École Normale of Paris, are continuing with good results the researches of Joly on platinum groups of metals. Brizard, of the École Normale, has continued the study of the osmiamates begun by Joly. These compounds were discovered by Fritzsche and Struve half a century ago, being formed by the action of ammonia and caustic potash on osmium tetroxid. The formula assigned was $K_2Os_2N_2O_5$. Joly was led to suspect that the compound contained the NO group, analogous to his nitroso compounds of ruthenium, and partial analyses and its decomposition products pointed in the same direction. Brizard has now confirmed this by complete analyses of the potassium, ammonium and silver salts, and the formula proposed by Joly $KOsNO_3$ is proven correct. The osmiamates

are thus salts of the anhydrid of a nitroso acid $OsNO(OH)_3$, which corresponds to a hydroxid of ruthenium $RuNO(OH)_3$ discovered by Joly.

IN the same number of the *Bulletin Soc. Chim.* is a paper by Professor Vèzes, of Bordeaux, continuing his work on the oxalates of the platinum metals. This paper takes up the oxalates of palladium. These may be formed directly by the action of potassium oxalate on potassium chlorpalladite in neutral solution, or by the action of oxalic acid on potassium palladonitrite. Unlike the case with platinum, the same salt is obtained in both cases, a potassium pallado-oxalate of formula $Pd(Ox)_2K_2 \cdot 3H_2O$. This salt is easily converted back into the chlorpalladite by hydrochloric acid, and into the palladonitrite by potassium nitrite in neutral solution. Professor Loiseleur, of Libourne, has succeeded in preparing the free pallado-oxalic acid. It thus appears, as with platinum, a very close relation subsists between K_2PdCl_4 , $K_2Pd(NO_2)_4$ and $K_2Pd\overline{Ox}_2$, and also that the pallado-oxalates are not double salts merely, but 'complex' salts and derivatives of a 'complex' pallado-oxalic acid.

PROFESSOR VÈZES has also contributed to the *Zeitschrift für anorganische Chemie* a short note on the volatilization of osmium in a stream of oxygen. The paper was occasioned by an article by Sulé on the same subject, showing that osmium is volatile at ordinary temperatures. Vèzes calls attention to the fact that Deville and Debray had long ago noticed this fact, which was further studied by Joly and himself. The volatility of osmium depends not only on the fineness of its division, but also upon the method of its preparation, some forms being volatilized appreciably at quite low temperatures.

THE so-called 'metallic' variety of phosphorus is shown by D. L. Chapman, in the *Proceedings of the Chemical Society* (London) to be identical with red phosphorus, their appearance under the microscope being similar. The alleged higher vapor tension of some varieties of red phosphorus is merely due to impurity. The vapors from red and from ordinary phosphorus are identical, and at the temperatures of boiling mercury and of boiling sulfur show a